Improving Patient Safety in Public Hospitals in South Africa with Minimal Resources

An Exploratory Investigation Using Evidence from the Field

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Abstract

The introduction of the organizational excellence (OE) management method in U.S. hospitals is emerging as an effective way to improve quality and lower cost in hospitals and health systems. OE is a system of management that relies on frontline workers to identify and solve problems and track results with patient outcome metrics daily. The management's job is to assure that the workers have training in problem solving and that the cultural environment exists for workers to speak up about problems. Leaders and managers must also be trained to be able to train their workers. We aimed to study whether training healthcare leaders to coach workers at the front line to identify and solve problems would result in fewer prenatal deaths in a resource constrained health setting in South Africa. The training was delivered virtually by U.S. coaches using standard materials and monthly phone calls. We chose hospitals in the public hospital system in the Gauteng province (greater Johannesburg and Westrand Districts) South Africa to test the hypothesis that OE can work in developing economies. We found that patient outcomes improve when leaders learn to coach frontline workers.

Introduction

South Africa currently spends 8.7 % of GDP on healthcare, but only 4.2 % on public healthcare. The public system covers some 50 million uninsured South Africans while the other 4.3 % of GDP is spent on private health care. The majority of the 8 million white South Africans have access to private insurance, private practice physicians and private for-profit hospitals. Public hospitals in South Africa are overcrowded and have difficulty serving the needs of the poor and mostly uninsured population. The results are long waiting times to see physicians and receive medicine, as well as very high hospital infection rates leading to death. Infant mortality hovers around 28/1000 vs. 5.8/1000 in the U.S.

Developing economies such as South Africa must utilize all healthcare resources the most efficient ways possible which is why we chose to study OE in South Africa. There is good evidence OE is being practiced in western economies (1) and achieving success (2). There is little evidence that OE is effective in developing economies such as South Africa. The primary factor cited is lack of resources. Our research shows that resources are not a significant constraint. Where leadership is committed to excellence, significant improvement can be obtained.

The OE method is a management system that has been applied in industry for many years. Toyota Motor Company is commonly associated with OE which leaders designated the Toyota Production System (3). The goal of OE is to create frontline worker empowerment. Leaders assure the frontline workers have the training to identify and solve problems as opposed to having management solve all the problems. Metrics are also established for improvement and frontline staff know whether they are winning or losing as they improve the work processes. OE requires operational managers and executives to lead and manage differently than traditional top-down healthcare management practices. Their focus must be on supporting the frontline worker

to become an effective problem solver. This is because the frontline worker knows best where the problems with care exist.

Charlotte Maxeke Johannesburg Academic Hospital (CMJAH) is a large teaching hospital with more than 1200 beds. It is associated with Witwatersrand University and one of the major referrals and teaching hospitals in South Africa. The hospital was struggling with high rates of nosocomial infections leading to large numbers of preventable deaths in children and adults. A high infant mortality rate was certainly the case at Leratong Hospital in the Westrand District. Leratong Hospital is an 850-bed regional hospital with 52 clinics, 6 mobile clinics, a psychiatric hospital and 17 other clinics scattered around the Johannesburg Metro. It serves a 1.5 million population with 84% of people being uninsured.

Methods

We chose Gauteng province because there is a unique set of barriers to management change which is a good test for our hypothesis. These include severely limited resources (4% GDP spent on public health system), no examples of organizational excellence in healthcare in South Africa, overburdened staff with excessive patient volumes and little professional development opportunities, very poor patients who lack transportation, reading skills, and easy to access to public health information.

We considered the intervention with the South African executives to be a coaching contract like those we have with health systems in the U.S. Our usual approach is to visit and observe the executives at least once every two months. In between these visits we have a phone call to determine the progress on the learning material. This was not possible due to distance in this case. Instead, our approach was to create a series of on-demand videos for each of our 12 executive learning modules. Along with the videos we included written materials derived from our many books and articles (4). Each month we had phone call follow-ups to determine progress and to answer questions. We began the intervention in January 2017 and was completed in March 2018. In addition, we had commitment from a Cape Town University professor experienced in OE to visit the executives every four months and report back to us. We began the intervention with a cohort of five public hospital CEOs in the Gauteng and Western Cape provinces of South Africa. The CEOs of Leratong, Charlotte Maxeke, and the Dr George Mukhari Academic hospitals in the Gauteng province and the Groote Schuure and Victoria hospitals in the Western Cape province agreed to participate. For the purposes of this report, we only considered the hospitals in the Gauteng province as data was not available for the Western Cape hospitals. But subsequent visits by U.S. coaches after the intervention to the Western Cape hospitals showed they also had made significant improvements in outpatient and inpatient departments. Within the first six months the CEO of the Dr. George Mukari Academic Hospital dropped out due to personal reasons.

As the work unfolded the two Johannesburg CEOs collaborated and shared with each other what was and was not working. It was easy for them to do so as both hospitals were in the greater Johannesburg region. An important take away was that these two CEOs were learning together and shared continually.

The monthly virtual coaching was structured on the 10 principles of organizational excellence from the Shingo Institute at Utah State University, USA (5) (fig.1).

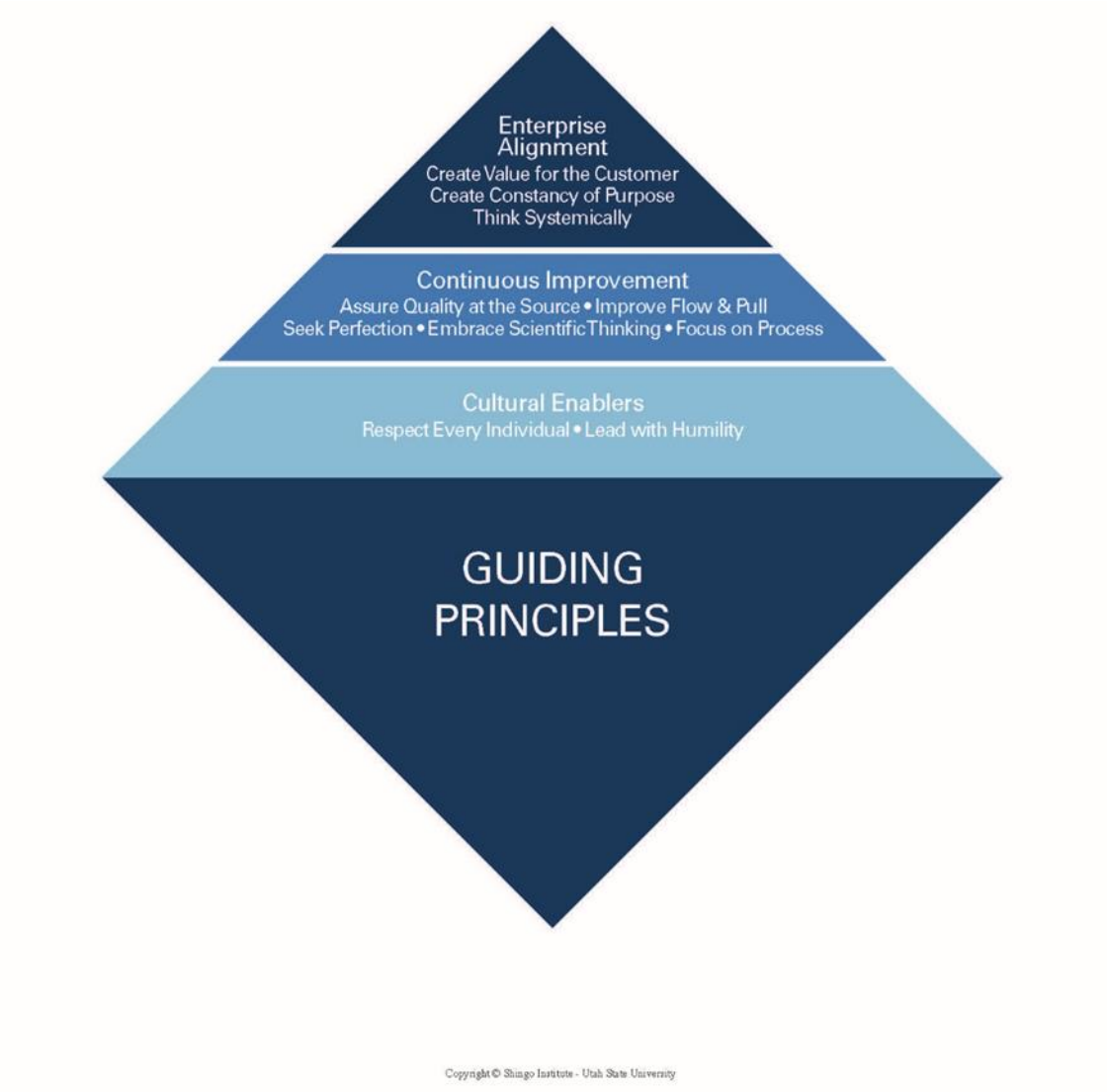

Figure 1 – The 10 Shingo Principles of Organizational Excellence

The overall goal for our coaching process was to ensure that every leader and manager at the front line should be asking questions, removing barriers to performance, and celebrating the great work of the frontline staff. This change in leader behavior (6,7) was critical to building the problem-solving skills of the frontline workers.

Once these new behaviors were being practiced the CEOs were asked by U.S. coaches to establish a model cell of deep improvement in a department in the hospital. At Leratong and Charlotte Maxeke this was in the NICUs. This would be the test of whether the OE principles were embedded. A model cell is an inch-wide, mile deep redesign of work processes that result in a new care model. It requires managers coaching frontline workers to improve processes and to remove waste in the existing process.

At Leratong Hospital, which is an 800-bed community hospital, huddle boards were placed on the wall in the NICU. Critical metrics regarding baby deaths and infections were updated daily. Every staff member was thus aware of the problems causing these deaths. The new management system made the problems visual, and staff started to speak up, as managers, now trained to listen to staff carefully, sought their help in understanding the barriers the staff faced. Managers began soliciting staff ideas for solutions.

A major driver of NICU deaths was determined to be short staffing. The visual board in the ward showed a monthly run chart of absenteeism. In January there were over forty shifts that were not covered (fig.2). Absenteeism was driving poor outcomes. The staff did not understand how missing work was impacting safety. But as the new management system was built, managers and frontline workers could better see how absenteeism and staff shortages were impacting clinical outcomes. Mangers found in some instances of absenteeism that staff were caring for their own children and families who were sick at home. They discovered these staff members could get help for parts of the day, so the staff members were encouraged to take a portion of the day off instead of the entire day.

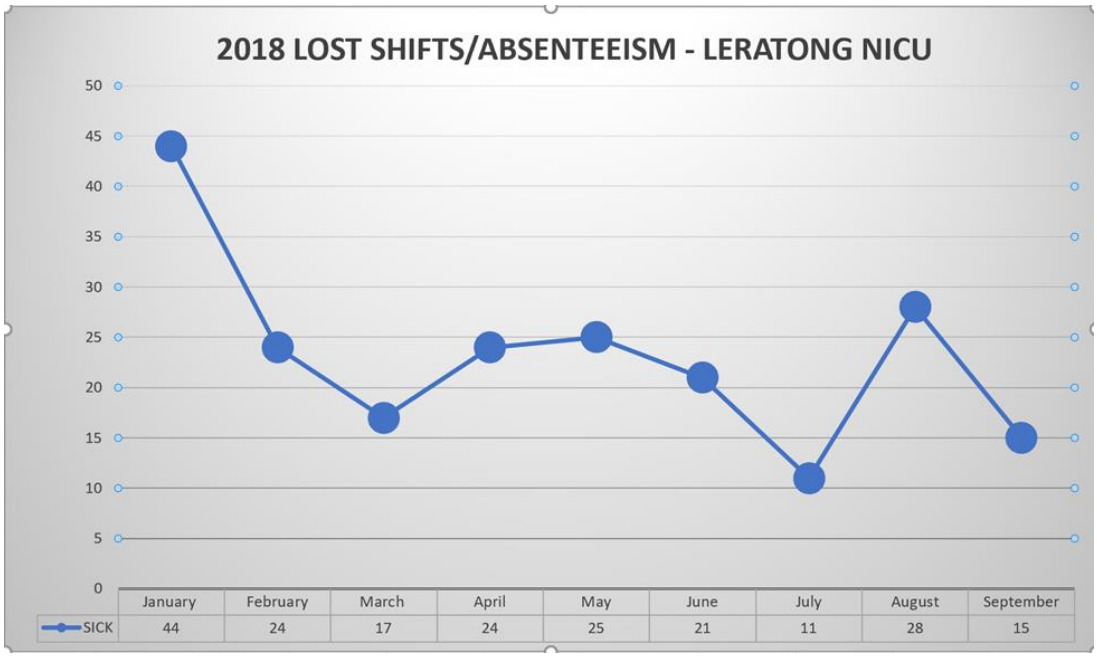

Figure 2 – Lost Shifts Due to Absenteeism

With simple changes and communication, the NICU went from 44 absentee shifts to 14 in the first nine months of 2019. NICU infection rates during this period dropped from 16% in 2017 to 1.4% as of September 2019. The overall drop in infant mortality went from 23.6/1000 (better than average for South Africa) in April 2017-March 2018 to 12.4 /1000 in April 2018-March 2019, a 47% reduction, and continued to fall through the end of 2019 to 8.4/1000. The improvement equated to 73 fewer babies dying than the year before (fig.3). Outcomes were the result of the team addressing the absenteeism problem and reducing NICU infections by assigning a staff member to observe every person, including doctors, washing their hands. Charlotte Maxeke, on the other hand, is a major teaching hospital and rotates many new residents and medical students through the clinical departments and sometimes they are not trained on proper handwashing techniques.

	No. of in-facility neonatal deaths					No. of live births					In-facility neonatal deaths per 1000 live births				
	Apr14-Mar15	Apr15-Mar16	Apr16-Mar17	Apr17-Mar18	Apr18-Mar19	Apr14-Mar15	Apr15-Mar16	Apr16-Mar17	Apr17-Mar18	Apr18-Mar19	Apr14-Mar15	Apr15-Mar16	Apr16-Mar17	Apr17-Mar18	Apr18-Mar19
Leratong hospital	49	66	146	141	82	6275	5740	5559	5985	6587	**7.8**	**11.5**	**26.3**	**23.6**	**12.4**
Charlotte Maxeke Johannesburg Academic hospital	293	256	234	278	234	9295	9123	8970	8593	8375	**31.5**	**28.1**	**26.1**	**32.4**	**27.9**
Kalafong hospital	118	60	101	88	121	6235	6629	6236	6522	6455	**18.9**	**9.1**	**16.2**	**13.5**	**18.7**
Thelle Mogoerane hospital	300	252	250	279	154	9935	9551	9215	9395	7447	**30.2**	**26.4**	**27.1**	**29.7**	**20.7**

Figure 3 – NICU Death Rates in Four Hospitals in Gauteng Province

With the power now instilled in them by leadership, NICU frontline workers met together and decided someone should oversee making sure doctors and visitors were washing their hands. Housekeepers had documented some of these physicians were not washing their hands at all. So, the security team took it upon themselves to stand at the doorway and assure everyone entering the NICU had washed their hands. Within the previous two years at least 12 different organisms had been identified as infectious agents in these patients.

A housekeeper was assigned the task of teaching new mothers how to wash their hands before entering the NICU. Infection rates began to drop but the housekeeper reported some of the residents and even attending doctors were not washing their hands. She volunteered, together with the other two housekeepers to train the doctors. Management and leadership encouraged them, and they were given the task of teaching residents and in some cases, attending physicians, exactly how to wash their hands. At Charlotte Maxeke, as their work was instituted, a dramatic drop in NICU infections occurred. From 2017 to 2018 rates dropped from 17% to 4.5%. By October of 2019 they had dropped to 2.5% and were sustained. Their NICU has not reported any outbreaks since August 2017, when it was previously the norm to have two to three outbreaks of new pathogens per year. However, actual mortality rates in the NICU did not change significantly (fig.3). Charlotte Maxeke is one of the 10 central hospitals in South Africa who receive all the very sick and complicated neonates from all lower category of hospital. All

hospital that were used to compare data, refer to a central hospital. Although there was no significant drop in mortality, there was a noticeable reduction in the average length of stay (ALOS) for very sick patients, including reduction in utilization of expensive antibiotics. Further studies should be done to quantify the reduction in the period of stay in NICU and the cost of savings in medication.

We compared the NICU death rates with two other regional hospitals in the Gauteng Province where no OE intervention occurred (fig.3). These two hospitals, Kalafong and Thelle Mongerone, are community hospitals like Leratong. Charlotte Maxeke is a large academic medical center. There was a significant difference in the death rates at Leratong compared to that of the other two community hospitals. In addition, there was dramatic improvement of death rates in Leratong over the January 2017-March 2019 time period. Charlotte Maxeke did not see a significant improvement despite many positive interventions as noted above.

Discussion

Implementation of the organizational excellence model entails development of a system of daily management activities that support the frontline clinical and non-clinical staff in the identification and solution of problems they encounter in their roles. Daily problem solving involving frontline staff is critical. Staff ideas are solicited during daily unit huddles in the department. A manager leads a team of workers to identify and then work to address organizational problems. The manager teaches a standard problem-solving process of plan-do-study-act cycles and staff use this process to find solutions. These unit level activities are measured daily and reported on a visual board in the department. Staff huddle at the board daily for 15 minutes to review the performance on key metrics that impact patient care. In the Gauteng province, the Member of Executive Council (MEC), the minister of health had defined the True North metrics for all the hospitals. Hospitals had to focus on six high-level metrics: waiting times, patient safety, infection control, cleanliness, availability of essential medications, and values and attitude. The work at Leratong and Charlotte Maxeke focused on patient safety involving every staff member in the NICU in reducing mortality. Each hospital achieved significant reduction of infections in the NICU by utilizing frontline workers ideas to improve care. Many other improvements occurred, including significant reductions in maternal mortality and improvement in wait times in other departments as well.

Limitations

The work only focused on four hospitals in one country, South Africa. We did not have a matched cohort of hospitals, but we were able to compare performance in hospitals not introduced to OE in the Gauteng province. Leadership of the hospitals learning OE committed to regular follow-up from U.S. coaches and translated their knowledge throughout their organization. Without this commitment, there would not have been progress. Political support is important, but in this case was not necessary. There were three different health ministers in the

time frame this work was accomplished with varying degrees of support by the different administrations.

Conclusion and Implications for Developing Countries

We believe this low-cost approach can work in other African hospitals or anywhere around the world where resources are scarce. We've learned that a virtual coaching model can leave management capability behind in healthcare leaders in a developing economy nation which leads to large improvements in health outcomes for the poor. We've learned that leadership and management commitment to learning is required for success. In the initial cohort of CEOs we virtually coached there were five participants, and four were successful at changing their own behavior and becoming coaches for their staff. We found that problem-solving capabilities exist within the frontline teams and OE consultants only need to be peripherally involved on the ground. At both Leratong and Charlotte Maxeke there was one consulting resource internal to the provincial health office. He was knowledgeable in the continuous improvement method. The Cape Town University professor visited these hospitals every fourth month and the provincial coach visited once or twice a month. The managers and leaders were forced to learn simply by utilizing the learning materials provided. In fact, one of the CEOs said she had looked at one of the U.S. coaches' 20-minute videos at least 20 times.

In countries where resource constraints exist, organizational excellence may be the best way to achieve better patient outcomes at a low cost.

References

(1) Shortell, S., Blodgett, J., Rundall, T. & Kralovec, P. (2018) Use of Lean and Related Transformational Performance Improvement Systems in Hospitals in the United States: Results from a National Survey. The Joint Commission Journal on Quality and Patient Safety, 44(10), 574–582. https://www.jointcommissionjournal.com/article/S1553-7250(18)30021-7/pdf

(2) Center for Lean Engagement and Research in Healthcare. (2019). 2019 Lean Healthcare Research Symposium. Retrieved February 2020 from http//clear.berkeley.edu/2019/07/2019-symposium-slides-now-available/

(3) Toussaint, J., Griffith, J., & Shortell, S. (2020). Lean Shingo and the Baldrige Framework, A Comprehensive Method to Achieve a Continuous Improvement Management System. NEJM Catalyst, 1(3). https://catalyst.nejm.org/doi/full/10.1056/CAT.20.0114

(4) Barnas, K. (2011). ThedaCare's business performance system: sustaining continuous improvement through hospital management in a lean environment. The Joint Commission Journal on Quality and Patient Safety, 37(9), 387-99.

(5) Shingo Institute. (n.d.) The Shingo Model. Retrieved 07/12/20 from, https://shingo.org/shingo-model/

(6) Toussaint, J. & Ehrlich, S. (2017). Five Changes Great Leaders Make to Develop an Improvement Culture. NEJM Catalyst. https://catalyst.nejm.org/five-changes-great-leaders-improvement-culture/
(7) Collins, J. (2005). Level 5 Leadership: The Triumph of Humility and Fierce Resolve. Harvard Business Review. https://hbr.org/2005/07/level-5-leadership-the-triumph-of-humility-and-fierce-resolve

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